



Biogas generation from wastewater, Thailand

Captured methane from starch plant wastewater is being used as fuel in existing heat generating devices, replacing the use of heavy fuel oil.

Location



The starch plant is located 250 km east of Bangkok in a rural region in Sidao district, on the Thai-Cambodian border. The region, stretched between the coast of the Gulf of Thailand and the Chanthaburi mountain range, is typified by agriculture, with farmers growing tropical fruits and cassava, and gemstone mining.

Project



Thailand is one of the world's most important starch exporters, with its production based on cassava, a plant that grows well in dry and low-nutrient soil conditions. Until recently, the country's many starch factories were struggling with their high demand of water for washing the cassava, with pungent odour emissions and high fossil fuel cost for drying the starch. Today, funded by carbon revenues and private investment, a one-in-all solution successfully tackles the above problems and at the same time saves greenhouse gas emission from entering the atmosphere.

Prior to this small scale project activity, the plant's wastewater was treated in cascading open anaerobic lagoons, with a retention time of more than one year. This resulted in heavy emissions of methane, one of the strongest greenhouse gases, from the organic content of the wastewater. Now, the project activity replaces the old treatment with a modern *Upflow Anaerobic Sludge Blanket (UASB)* reactor system. The captured biogas is used for energy production instead of being released to the atmosphere, and replaces fossil fuels in the starch drying process which saves even more greenhouse gases from heating up the climate. In the end, the recycled water can be re-used in the plant for cleaning the cassava, which saves many tons of freshwater per day.

Apart from the positive climate effects, the project also benefits the local community by actively supporting higher education through scholarships. Last but not least, the strong odour nuisance has dropped.

Project achievements



Socio-economic impact:

- A number of temporary jobs for locals was created during construction of the new wastewater cycle, and several permanent jobs to operate and maintain the biogas facilities.
- Workers receive special training on modern technology to improve their skills.
- The project owner funds a scholarship program to enable higher education for local students.
- Due to rapidly and continuously rising oil prices, the Thai government has set an ambitious target for the share of renewable energy in electricity production. In 2003, the government has published the "Energy Strategies for Competitiveness" which aims to increase the share of renewable energy in Thailand from 0.5% in 2002 to 8% by 2011. This project represents an outstanding example of successful initiatives to support this goal.
- Residents enjoy better living conditions thanks to avoided odour emissions (compared to pre-project status).

Environmental impact:

- The project activity improves water and air quality significantly, mainly due to the high efficiency of the biogas reactor and improved process control as compared to open lagoons.
- In addition, large amounts of fresh water are now saved since the new biogas reactor system allows the starch factory to reuse the treated effluent in the production process.

Checklist Project 300 085



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| ✓ Additionality and permanence: | according to the rules of the Gold Standard and the UNFCCC |
| ✓ 3 rd party verified:: | by TÜV Rheinland |
| ✓ Transparency: | provided by the Gold Standard and UNFCCC Registry |
| ✓ Annual CO ₂ reduction: | 28,000 tCO ₂ e |
| ✓ Social and environmental benefits: | as documented in our database |
| ✓ Marketing material: | high resolution pictures available |

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